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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

APPENDIX A
TO
FINDINGS OF MITIGATION
AND
ADOPTION OF MITIGATION MONITORING PROGRAM
FOR
KAISER VENTURES, INC. OWNER
KAISER EAGLE MOUNTAIN, INC., OWNER
MINE RECLAMATION CORPORATION, OPERATOR
EAGLE MOUNTAIN RECLAMATION, INC., OPERATOR
EAGLE MOUNTAIN CLASS III MUNICIPAL WASTE LANDFILL
Eagle Mountain – Riverside County

A. DISCHARGE PROHIBITIONS

1. The discharge of the following wastes as defined in Title 27 is prohibited at the Eagle Mountain Landfill site:

    a. Hazardous waste, except for waste that is hazardous due only to its friable asbestos content,
    b. Liquid waste (moisture content more than 40%)
    c. Items included under the metallic discharge ban, including white goods (i.e., large intact household appliances),
    d. Medical wastes,
    e. Designated wastes,
    f. Incinerator ash,
    g. Radioactive waste.

3. The discharge or deposit of wastes, which can cause erosion or decay, or otherwise reduce or impair the integrity of the containment structures, is prohibited.

4. The discharge or deposit of waste which is mixed or commingled with other wastes in the Landfill which could produce chemical reactions that create heat or pressure, fire or explosion, toxic byproducts, or reactions which, in turn:

    a. Require a higher level of containment than provided by this unit;

    b. Are “restricted hazardous wastes”; or

    c. Impair the integrity of the containment structure

    is prohibited.

B. DISCHARGE SPECIFICATIONS

3. The treatment or disposal of wastes at this waste management facility shall not cause pollution or nuisance as defined in Sections 13050(l) and 13050(m) of Division 7 of the California Water Code.

4. For ground water quality protection, the dischargers shall install the following:

   a. A composite liner over the entire base of the Landfill, meeting the minimum requirements of Subtitle D, 40 CFR, Part 258 and Title 27;

   b. An alternative composite liner on the side slopes meeting the minimum requirements of Subtitle D, 40 CFR, Part 258 and Title 27;

   c. A leachate collection and removal system (LCRS);

   d. LCRS sumps;

   e. An unsaturated zone liquid monitoring system (UZLMS) beneath the base of the Landfill that also functions as a secondary leachate detection, collection and removal system;

   f. An unsaturated zone gas monitoring system (UZGMS) beneath the entire Landfill which functions as a gas detection, collection and removal system;

   g. An active gas extraction system;

   h. A perimeter gas monitoring system;

   i. A daily, interim and final cover system;

   j. A surface water management system; and

   k. An ambient air monitoring system.

5. The dischargers shall construct the following liner systems for base, side slopes, benches and ridges, and final cover for the Eagle Mountain Landfill site:

   a. Base Liner – areas of the Landfill such as bottoms of canyons and pits with a foundation of grade of 3H:1V or less.

      1. The composite primary liner shall consist of:

         a. A 16-oz./yd^2 nonwoven needlepunch geotextile
         b. An 80-mil textured (both sides) HDPE geomembrane; and
         c. A two-foot thick soil liner with low permeability of $K \leq 1 \times 10^{-9}$ cm/s.

      2. The secondary composite liner shall consist of:

         a. A 16-oz./yd^2 nonwoven needlepunch geotextile
         b. An 80-mil textured (both sides) HDPE geomembrane; and
         d. A geosynthetic clay liner (GCL) with hydraulic conductivity of $K \leq 1 \times 10^{-9}$ cm/s.

b. Side slopes – areas of the Landfill with foundation grade greater than 3H:1V, including benches.

1. The composite liner shall consist of

a. A 16-oz./yd^2 nonwoven needlepunch geotextile
b. An reinforced GCL ($K \leq 1 \times 10^{-9}$ cm/s); and
c. An 80-mil HDPE, smooth on top and textured on the bottom.

c. Benches and Ridges - areas of the Landfill on the side slope with slopes of 3H:1V, or less.

1. The composite liner shall consist of

a. A 16-oz./yd^2 nonwoven needlepunch geotextile
b. A reinforced GCL ($K \leq 1 \times 10^{-9}$ cm/s); and
d. An 80-mil HDE (textured on both sides).

d. Interim cover shall consist of:

1. Daily cover composed of a minimum of 6 inches of compacted soil, or alternative material placed over the waste during or at the end of each working day; and

2. Intermediate cover composed of a minimum of 12-inch of compacted soil, or equivalent, placed over waste areas which shall be inactive for periods greater than 180 days; existing daily cover may be used as part of the intermediate cover.

e. The final cover for the Eagle Mountain Landfill shall be constructed as follows (in ascending order):

1. Foundation for final cover layer – a 24-inch thick layer low-permeability (upper 18 inches must have $K \leq 1 \times 10^{-5}$ cm/s) soil layer to mitigate the effect of differential waste settlement and subsidence on the overlying low permeability layer, and provide a firm smooth subgrade for placement of lower permeability barrier layer (VLDPE).

2. VLDPE – A 40-mil very low-density polyethylene (VLDPE) ($K \leq 1 \times 10^{-10}$ cm/s) geomembrane.

3. Geotextile – A 12-oz/yd^2 nonwoven needlepunch geotextile cushion.

4. Protection layer – A protection layer type B with $K = 1 \times 10^{-2}$ cm/s to protect the VLDPE from damage due to equipment traffic and the overlying erosion layer.

5. Geotextile – an 8-oz/yd^2 nonwoven or woven geotextile.

6. Erosion layer – a 24-inch thick coarse granular material shall be placed on top of the protection layer to control erosion that may be caused by storm water runoff, and to visually blend with the surrounding environment.

7. Slope of the final cover shall be no steeper than 3H:1V on the side and on the top of the Landfill, the slope shall be a minimum of 3 percent.

6. The interim and final covers for the Eagle Mountain Landfill shall:

a. Control odors, vectors and litter;

b. Minimize infiltration into the Landfill;

c. Control erosion and convey runoff to the storm water management system at manageable, non-scouring flow rates; and

d. Control and contain Landfill gas.

7. The dischargers shall cover disposed waste with six inches of earthen material at the end of each operating day, or at more frequent intervals if necessary, to control disease vectors, fires, odors, blowing litter, and scavenging. Any alternative materials of alternative thickness shall be approved by the Regional Board's Executive Officer prior to use. The dischargers shall demonstrate that the alternative material and thickness control disease vectors, fires, odors, blowing litter, and scavenging without presenting a threat to human health and the environment.

8. A compacted layer of at least 12 inches of intermediate cover shall be placed on all surfaces of the fill where no additional refuse will be deposited within 180 days.

11. East subphase shall be on the order of 10 to 40 acres to minimize:

a. The amount of leachate caused by direct precipitation onto the working phase; and

12. The dischargers shall design, install and operate a primary leachate collection and removal system (LCRS) immediately above the primary composite liner in the base, benches and ridges, and side slopes of the Landfill.

13. The LCRS at the Eagle Mountain Landfill shall:

a. Function without clogging through the active life of the waste management unit and during the post-closure maintenance period.

b. Maintain less than one-foot (1 ft.) depth of leachate over any of the Landfill liner.

c. Have a slope of 4% in the base, benches and ridges, and a slope of 1.5 (minimum) H:1V on the side slopes.

d. Remove twice the maximum anticipated daily volume of leachate from the waste management unit.

e. Consist of a permeable subdrain layer that covers the bottom of the waste management unit and extends as far up the side slopes as possible (i.e., blanket-type).

f. Be of sufficient strength and thickness to prevent collapse under the pressures exerted by the overlying waste, waste cover materials, and by any equipment used at the waste management units.

14. The LCRS shall consist of the following:

a. Drainage Layer

1. In the base area of the Landfill, and on benches and ridges, the drainage layer shall be 18 inches thick. The drainage material shall be gravel type A(K > 1 cm/s, maximum particle size of 1.5 inches and not more than 3% passing a U. S. Standard No. 200 sieve). In the base area, an 18-inch thick protection layer shall overlie the LCRS with an 8-oz/yd^2 nonwoven, needlepunch, geotextile filter between drainage gravel (LCRS gravel) to control the potential for particle migration. In the benches and ridges, gravel Type A

shall be overlain by LCRS gravel Type B ($K \leq 1 \times 10^{02}$ cm/s, maximum particle size 1.5 inches, and fine content $\leq$ 5%) as a protection layer. An 8-oz/yd^2 nonwoven, needlepunch geotextile filter between Type A and Type B gravel shall be used to control the potential for particle migration.

2. In the side slope areas of the Landfill, the LCRS drainage layer shall be in the range of 3 feet to 20 feet in thickness and shall use LCRS gravel Type B as drainage material.

b. Drainage Corridor – Any leachate collected by the LCRS drainage layer shall flow by gravity to LCRS drainage corridors, which in turn shall direct the leachate to LCRS sumps or directly flow to LCRS sumps. Each drainage corridor shall be constructed as follows, so that leachate buildup does not occur:

1. A two-foot thick central core of coarse, granular drainage corridor gravel with hydraulic conductivity of at least 10 cm/s, a particle size of 2.5 inches and not more than 2% fine. The drainage corridor shall be separated from the composite liner by a 16-oz/yd^2 nonwoven, needlepunch geotextile cushion and a 0.5-foot thick layer of LCRS gravel Type A. A 1.5-foot protection layer Type A shall overlie the drainage corridor. The LCRS gravel shall be encapsulated by an 8-oz/yd^2 nonwoven, needlepunch geotextile to prevent any particle migration from surrounding materials.

c. Sumps

1. A total of ten LCRS sumps (two each in Phase 1 and Phase 2, and three each in Phases 3 and 4) shall be constructed, in the base of the Landfill, for collection and removal of any leachate that percolates into the LCRS.

2. The sumps shall be the lowest points in the Landfill to which any leachate flows.

3. The sumps shall be 50 x 40 in plan dimension and up to 6.5 feet in depth.

4. The sumps shall be filled with drainage corridor gravel with hydraulic conductivity of at least 10 cm/s.

5. An 18-inch thick protection layer (Type A) shall be placed above the drainage corridor gravel in the sumps.

6. An 8-oz/yd^2 geotextile shall encapsulate the drainage corridor gravel to control the potential for particle migration.

15. The dischargers shall direct any leachate removed from the LCRS sumps into a leachate management system for temporary onsite above ground storage tanks followed by transport to an approved wastewater treatment plant.

18. The dischargers shall test the LCRS on an annual basis to demonstrate that the system is functioning properly. The dischargers shall submit the test results to the regional board pursuant to Section II of Monitoring and Reporting Program No. 99-061, and revisions thereto.

19. The dischargers shall ensure that the foundation of the Landfill and the structures which control leachate, surface drainage, erosion and gas mitigation for this site, are constructed and maintained to withstand conditions generated during a maximum probable earthquake event.

20. Leachate sumps and interim and final berms shall be designed and constructed to withstand the maximum probable earthquake at the facility.

21. Leachate collection sumps shall be designed and operated to keep leachate levels at the minimum needed to ensure sufficient pump operation. Leachate collected shall be disposed of in accordance with local, state, and federal regulations.

22. The dischargers shall submit a detailed Leachate Management Plan acceptable to the Regional Board's Executive Officer for the Landfill 90 days prior to the disposal of any waste. This Plan shall estimate the quantity of leachate produced, the storage of leachate, and ultimate disposal of the leachate. The report should evaluate the quantity of the leachate produced from each unit and determine the maximum safe operating level for the leachate containment facilities. The plan shall provide a detailed assessment of alternative and disposal methods along with a plan for implementation of preferred alternatives. If recirculation of leachate is to be considered, the dischargers must demonstrate that the quantity of leachate being recirculated will not result in a solid-to-liquid ratio larger than 5:1 by weight in that phase of the Landfill.

23. The dischargers shall install a secondary leachate detection removal system or unsaturated zone liquid monitoring system (UZLMS) immediately underneath the first composite liner system in the base of the Landfill to monitor any leachate that might have penetrated through the primary composite liner.

24. The USLMS shall consist of:

    a. Unsaturated zone liquid monitoring layer

        1. This drainage layer shall be constructed of coarse, granular material with a minimum hydraulic conductivity of 1×10^{-1} cm/s.

        2. This layer shall be at least one-foot thick and have a minimum slope of four percent to promote flow to unsaturated zone monitoring stations.

    b. Liquid barrier:

        1. A liquid barrier shall be constructed immediately beneath the unsaturated zone liquid monitoring layer to provide a physical barrier to downward migration of liquid.

        2. The liquid barrier shall be constructed of an upper component consisting of an 80-mil HDPE (textured on both sides) geomembrane and a lower component, consisting of a geosynthetic clay liner (GCL) with hydraulic conductivity of 1×10^{-6} or less. A 16-oz/yd^2 nonwoven, needlepunch geotextile cushion shall be placed directly on the HDPE for protection.

    c. Unsaturated zone liquid monitoring stations:

        1. Monitoring stations shall be used to perform detection monitoring for liquids in the unsaturated zone immediately below the Landfill.

        2. Each monitoring station shall be located within each sump, and shall be capable of monitoring the area immediately beneath the LCRS sumps.

        3. A total of ten monitoring stations shall be installed at the Eagle Mountain Landfill.

25. An active gas detection, extraction, and monitoring system shall be installed at the Landfill. This system shall be comprised of the following components:

    a. Vertical gas extraction system with:

1. Approximately 1,000 vertical gas extraction wells shall be progressively installed within the Landfill. The perimeter vertical gas extraction wells shall be located approximately 150 feet inside the limits of the containment system on approximately 200-foot centers. Interior wells shall be approximately 300-400 foot centers. This system shall extract gas from the Landfill under a small vacuum. The system shall control gas by promoting Landfill gas flow from the waste toward the gas extraction wells.

2. landfill gas collected and removed by the gas extraction system shall be conveyed by a gas collection header and pipeline system to flare stations for ultimate treatment and disposal by thermal combustion.

3. Enclosed gas flares shall be installed in four areas along the southern portion of the Landfill, as shown on Attachment 29.

4. Condensate formed in the header pipe shall be drained by pumping from the condensate pump stations to dedicated condensate storage tanks equipped with secondary containment systems, or by pumping into the leachate transmission pipeline. Condensate formed in the header system shall not be drained into the gas extraction wells, the Landfill, or the LCRS.

b. Perimeter gas monitoring system: a gas monitoring system shall include the installation of permanent gas monitoring probes around the perimeter of the Landfill as well as monitoring of ambient air, and onsite structures for the presence of Landfill gas. In addition to methane, emissions from the surface of the Landfill shall be monitored periodically to ensure that emissions from the Landfill surface are within state and federal guidelines established by the SCAQMD. Detection of potential odors associated with the release of LFG and daily landfilling operations shall also be monitored on a regular basis.

   Perimeter gas monitoring probes shall be installed as follows:

   1. For waste up to 10 feet deep – A shallow probe 10 feet deep.

   2. For waste depth greater than 10 feet and less then 30 feet – A second probe (intermediate probe) to a minimum depth of 30 feet.

   3. For waste greater than 30 feet – A third probe (deep probe) to the depth of the waste.

   When the Landfill is completed, the site shall be ringed by a network of approximately 63 gas monitoring locations with up to three monitoring probes at each location. Probes shall be located between the limits of waste and the project boundary at a maximum spacing of about 1,000 feet, as shown on Attachment 29.

c. Unsaturated Zone Gas Monitoring System (UZGMS)

   1. Approximately 200 gas probes shall be installed every ten acres beneath the Landfill to locally monitor unsaturated zone gas quality, as shown on Attachment 30A, 30B, and 30C.

   2. Gas monitoring probes shall consist of ten-foot long sections of slotted high-density polyethylene (HDPE) pipes.

   3. HDPE pipes and probes, and associated pipe bending material, shall be designed to function under the load that will be imposed by the Landfill. The gas probe slot size shall be designed to prevent particulate clogging of the probe.

   4. The gas monitoring parameter shall be methane.

5. Monitoring shall be done from a sampling port at the Landfill perimeter by applying suction to the port with a positive-displacement, leak-tight vacuum pump.

6. Methane concentration of the gas shall be measured quarterly.

7. Monitoring shall be conducted by a third party, an independent contractor, and the results shall be submitted by a Civil Engineer or an Engineering Geologist, registered in the State of California.

26. For any material used for all or any portion of the UZGMS, UZLMS, base liner, LCRS, side slope liner, vertical gas collection removal system, daily, intermediate and final cover, the dischargers must demonstrate leachate compatibility, shear strength, under the applicable normal forces, and any other applicable requirements as stated in Specification 46 of this Board Order.

27. The exterior surfaces of the disposal area, including daily cover, and intermediate and final covers shall be graded and maintained to promote lateral runoff of precipitation and to prevent ponding.

29. Drainage features within the Landfill footprint shall be designed to accommodate the 100-year 1-hour, 100-year, 24-hour, and 500-year, 3-hour storm events.

30. A minimum depth of freeboard of two (2) feet shall be maintained for any storm event at all times in any sedimentation pond that received runoff from the Landfill.

31. The dischargers shall install a surface water management system at the Eagle Mountain Landfill. This surface water management system shall be designed to:

    a. Isolate the Landfill by diverting surface water runoff from adjacent areas around the Landfill footprint;

    b. Isolate the daily Landfill cell (i.e., active area with exposed waste) by diverting surface water runoff from Landfill areas with intermediate or final cover away from the active area;

    c. Limit infiltration, inundation, and ponding within the daily Landfill cell.

    d. Limit erosion, slope failure, washout, and overtopping of the surface water conveyance and retention structures; and

    e. Limit erosion of interim and final cover.

32. The following types of surface water management features shall be installed at the site:

    a. Interim drainage, erosion, and sediment control features within the Landfill footprint (on-Landfill), such as temporary detention basins, interim downchutes, interim swales, bench ditches, channels, side slope spillways, berms, silt fences, and hay bales, as shown on Attachments 16, 17, and 18, shall be designed to collect and control surface water flow during landfilling operations. These features may be modified periodically as landfilling operations progress.

    b. Final on-Landfill drainage, erosion, and sediment control features, such as final cover benches, downchutes, swales, final cover access road channels, and energy dissipators, shall be designed to collect and convey surface water flow across portions of the Landfill where the final cover has been constructed, as shown on Attachments 19, 20, 21, and 22.

c. Final off-Landfill drainage control, erosion, and sediment control features outside the Landfill footprint, such as haul road and maintenance road drainage channels, spillways, energy dissipators, and three detention basins, shall be designed to collect and convey surface water flow around the perimeter of the Landfill, as shown on Attachments 19, 20, 21, and 22.

33. The dischargers shall implement the following measures for surface water control at the Eagle Mountain Landfill:

a. Off-Landfill surface water runoff – during the progressive development of the Landfill, the noncontact water (surface water that does not come in contact with the waste) originating primarily from the drainage basins of the Eagle Creek and Bald Eagle Creek shall be controlled in stages by constructing three detention basins. The detention basins shall intercept the flow from these creeks and eventually discharge into the east bowl of the East Pit, or into a natural downstream watercourse.

b. On-Landfill surface water runoff (interim and final):

1. Noncontact surface water runoff within the boundary of the Landfill (i.e., precipitation that falls on the intermediate and final cover) shall be collected by a system of berms, ditches, downchutes, swales and drainage channels, and shall be diverted off the Landfill to the east bowl of the East Pit or to the natural courses offsite.

2. Any precipitation that falls on the working face of the Landfill and comes in contact with waste (contact water) shall be treated as leachate.

3. The working face of the Landfill shall be limited to one day of operation at a time, so as to minimize the amount of contact water.

c. Erosion control measures:

1. Where flow concentrations result in erosive flow velocities, surface protection such as asphalt, concrete asphalt, concrete riprap, or other erosion control material shall be used for protection of drainage conveyance features. Interim bench ditches shall be provided with erosion control material and riprap to control erosion where necessary.

2. Energy dissipators shall be installed to control erosion at locations where relatively high erosive flow velocities are anticipated.

3. Slopes on the Landfill shall be benched to control flow velocities.

4. Where high velocities occur at terminal ends of downchutes or where downchutes cross the final cover access roads, erosion control material shall be applied to exposed soil surfaces.

5. The interim detention basins in Phase 1 and final detention basins located along the north maintenance road shall also function as sediment basins as shown on Attachments 16 and 19.

6. Sediments shall be removed from the detention basins whenever the volume of the basin has been reduced by 25 percent of the basin's design capacity.

7. Silt fences, hay bales, and other measures as shown on Attachment 18 shall be used to control noncontact surface water runoff from Landfill areas where daily, intermediate and final cover have been placed, and from areas where Landfill containment system construction is occurring.

34. The dischargers shall use a network of nine surface water monitoring points (SW-1 to SW-9) to monitor the quality of surface water at the site. Five of the monitoring points (SW-1, SW-2, SW-3, SW-4, and SW-8) shall be used to monitor the quality of surface water runoff to establish background values. The remaining four monitoring points (i.e., SW-5, SW-6, SW-7 and SW-9) shall serve as compliance monitoring points. Surface water quality monitoring points are shown on Attachment 23, appended hereto as part of this Board Order.

36. The dischargers shall install a ground water monitoring system that consists of 27 downgradient point-of-compliance monitoring points (POCs) and nine upgradient background monitoring points (upgradient background wells) as shown on Attachment 23.

42. The dischargers shall, for any additional subphase, install additional ground water, soil-pore liquid, soil-pore gas, or leachate monitoring devices to comply with the Monitoring and Reporting Program of this Board Order, and revisions thereto. The dischargers shall submit to the Regional Board's Executive Officer 120 days prior to construction, the plan for these installations.

44. Methane, carbon dioxide and other Landfill gasses shall be adequately vented, removed from each subphase of the Landfill unit, or otherwise be controlled to prevent the danger of explosion, adverse health effects, nuisance conditions, or the impairment of beneficial uses of water due to the migration of gas through the unsaturated zone.

46. The dischargers shall submit to the Regional Board's Executive Officer, for review and approval, pursuant to Provision C.8.of this Board Order, "Final Construction Design Plans and Specifications" 120 days prior to initiation of construction of each subphase of the Landfill. The plans and specifications shall include the following:

    a. Criteria – the minimum acceptable criteria are as follows:

        1. Interim slopes shall have a safety factor of 1.35.

        2. Final slopes shall have a safety factor of 1.5.

        3. A small increase in shear strength not greater than represented by a dilation angle of 3° may be used to account for the kinematic constraints imposed by side slope benches.

        4. Increases in calculated two-dimensional (2-D) factors of safety to account for three-dimensional (3-D) conditions shall not exceed a factor of 1.05. Any correction factors greater than 1.05 must be supported with specific 3-D analyses for the critical surfaces of the Landfill subphase.

    b. Engineering Designs and Analysis – detail designs and analysis of all portions of the project shall include:

        1. Details of the minimum requirements (e.g., shear strength) associated with each element of the Landfill system required to meet slope stability criteria.

        2. Slope stability analyses shall explicitly model the actual liner slopes, including benches. The actual residual shear strengths corresponding to the actual liner interfaces shall be employed in the analyses.

        3. Seismic and status slope stability calculations for all slopes under the appropriate range of loading conditions.

        4. Evaluation of 3-D geometry effects for both interim and final slope conditions. This evaluation shall include the possibility that 3-D stability within lined canyons may be less

than that calculated for 2-D stability conditions. The potential increases in computed factors of safety for the effect of 3-D effects may be incorporated in the design of the slope. However, these factors must correspond to minimum acceptable criteria set forth in Specification 46.a. of this Board Order.

5. Calculations of the minimum factor of safety for interim and final slopes, pursuant to Specification 46.a.1 and 2.

6. Leachate head calculations.

7. Drainage system flow calculations.

8. Settlement analyses of the foundation, liner system and waste.

9. Analyses indicating the capability of the material used for containment systems such as HDPE, GCL, CT, or any other material to withstand the anticipated overburden pressures plus the weight of any operating equipment used that could cause axial loading on the containment system. It is noted that the maximum overburden pressures shall be approximately 42,000 lb/ft^2.

10. Any other applicable analysis.

c. Construction Drawings and Specifications – detailed sets of construction drawings and specifications with sufficient detail to build the Landfill containment system. The construction plans shall include horizontal coordinates (± 0.1 ft), elevations (± 0.1 ft), and grades (± 0.1%). The plan should show locations of all interim and permanent berms, ditches, downchutes, sumps, benches and ridges, pipe connection details, liner overlaps, liner seaming or welding, and layer minimum thickness.

d. Detailed Fill Plan – the fill plan detailing the limits of acceptable interim geometries for all locations of the Landfill subphase. All phases of construction where waste and/or fill is being placed over the completed liner system shall be considered to be interim waste slopes. Such slopes shall be designed to meet a minimum slope stability factor of safety of 1.35, using appropriate shear strengths of the materials involved, including residual shear strengths, where geosynthetic materials are involved.

e. Construction Quality Control-Quality Assurance – A Construction Quality Control-Quality Assurance (CQC-CQA) plan to be implemented during construction of the containment system by an independent engineering firm that is not owned in whole or in part by the dischargers. This plan shall contain, at a minimum, the following:

1. Quality control/quality assurance procedures for each geosynthetic and fill material to be incorporated within the Landfill liner and cover system.

2. Detailed testing, inspection, and acceptance criteria for each geosynthetic and fill material to be incorporated within the Landfill liner and cover system.

3. Detailed foundation acceptance criteria and acceptable interim waste slopes.

4. A plan for:

   a. Performing interface shear strengths, prior to liner installation, using the specific geosynthetic materials specified for different elements of the liners. The test shall be performed for the range of normal stress, moisture conditions, and displacement rates applicable with field conditions: and

b. Determination of shear strength values which must be equal to or greater than the shear strengths employed in the slope stability analyses performed during final design.

f. Contractor Quality Control – each contractor or manufacturer is responsible for implementing their own quality control plan as required by the detailed construction specifications. All materials and workmanship shall be tested in accordance with the quality control-quality assurance plan. All tests may be observed by the CQC-CQA firm, and all test results shall be submitted to the CQC-CQA firm for review and approval.

g. Field Changes

1. Construction drawings and specifications shall be developed to minimize, to the extent feasible, the need for "significant field changes". "Significant field changes" include, but are not limited to:

a. Changes in material specifications,

b. Changes in soil liner compaction criteria,

c. Changes in liner system component thickness,

d. Increase in side slope grades,

e. Decrease in bottom slope grades,

f. Decrease or increase in the height of the slopes,

g. Decrease or increase in the width of benches, and

h. Changes to the Landfill grading plan.

2. A plan outlining the following steps, which should be taken if a "significant field change" is found to be necessary:

a. The contractor shall notify the construction manager or the owner regarding the proposed change.

b. The construction manager or owner shall have the design engineer review the proposed change. The review shall include any engineering analyses that need to be done to ensure that all design criteria are met with the proposed change.

c. The dischargers shall submit the proposed change to the Regional Board's Executive Officer for review and approval. The proposed change shall be accompanied by an explanation for the change, a copy of the engineering analyses, and any changes to the design drawings and specifications.

d. The Regional Board's Executive Officer shall approve the proposed changes before it can be implemented. Such approval shall not be given unless supported by slope stability analyses demonstrating that the field changes do not result in slope stability factors of safety less than the minimum acceptable values.

47. The dischargers shall compact the fill at least 90 percent relative compaction in areas with fine tailings, alluvial soil, or any other soil material used as a part of the liner in accordance with ASTM Standards.

50. A periodic load checking program shall be implemented to ensure that hazardous materials are not discharged at the Landfill. The plan for the program must be acceptable to the Regional Board's Executive Officer and to the Department of Health Services pursuant to Title 27. The plan for the program shall include, but not be limited to:

    a. Number of random loads to be checked per day,

    b. Description of training program for onsite personnel and contract waste haulers,

    c. Record keeping and reporting program,

    d. Program implementation schedule, and

    e. Alternatives for waste found to be not in compliance with this Board Order.

54. Wastes shall not be placed in or allowed to contact ponded water from any source.

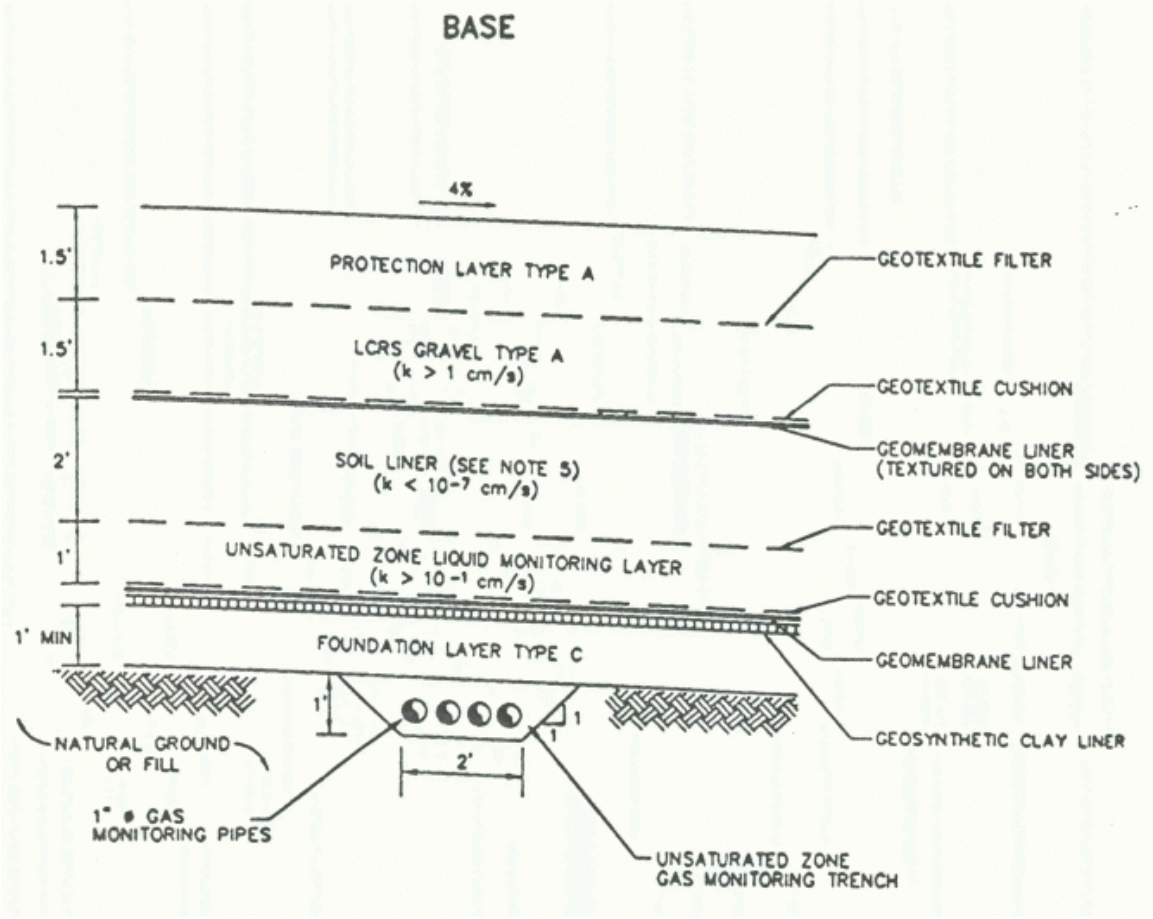
55. The dischargers shall remove and relocate any wastes that are discharged at this site in violation of these requirements.

60. Waste material shall not be discharged on any ground surface that is less than five feet above the highest anticipated ground water level.

C. PROVISIONS

24. The dischargers shall submit a detailed post earthquake Inspection and Corrective action Plan to be implemented in the event of any earthquake generating ground shaking of Modified Mercalli Intensity V or greater at or near the Landfill. The Plan shall describe the containment features, ground water monitoring, leachate control facilities, and gas monitoring facilities, potentially impacted by the static and seismic deformations of the Landfill. The Plan shall provide for reporting results of the post earthquake inspection to the Regional Board within 18 hours of the occurrence of the earthquake. Immediately after an earthquake event causing damage to the Landfill structures, the corrective action plan shall be implemented, and this Regional Board shall be notified of any damage.

38. The dischargers shall submit a report every five years that either validates the containment and monitoring systems ongoing viability, or poses and substantiates any needed changes (e.g., a documented increase in the monitoring systems' ability to provide reliable early detection of a release can cause a decrease in the Landfill financial coverage). The report due date is within five years of the date of adoption of this Board Order, and every five years thereafter.



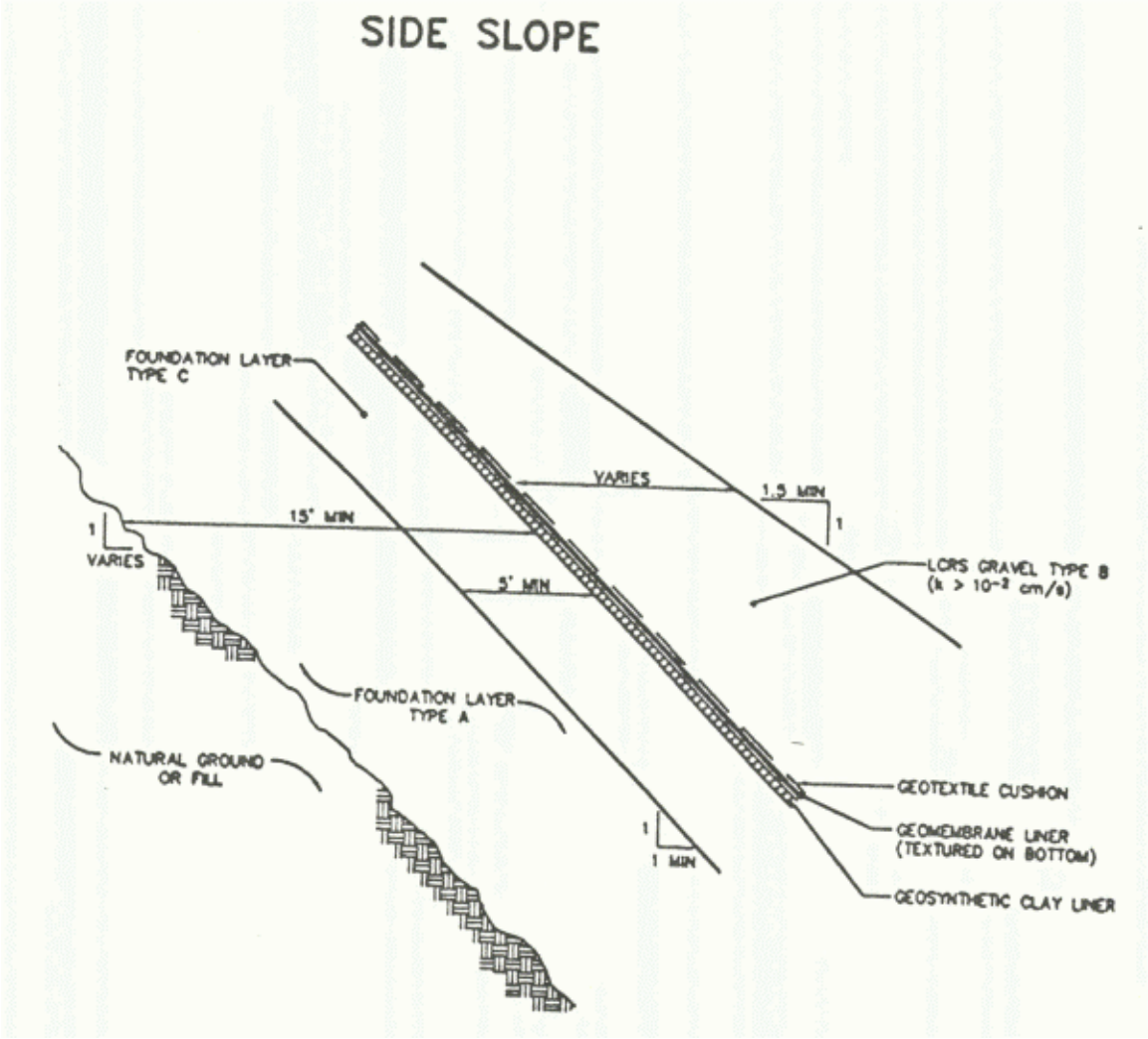
a. Base Liner – areas of the Landfill such as bottoms of canyons and pits with a foundation of grade of 3H:1V or less.

1. The composite primary liner shall consist of:

   a. A 16-oz./yd^2 nonwoven needlepunch geotextile
   b. An 80-mil textured (both sides) HDPE geomembrane; and
   c. A two-foot thick soil liner with low permeability of K≤ 1 x 10^{-9} cm/s.

2. The secondary composite liner shall consist of:

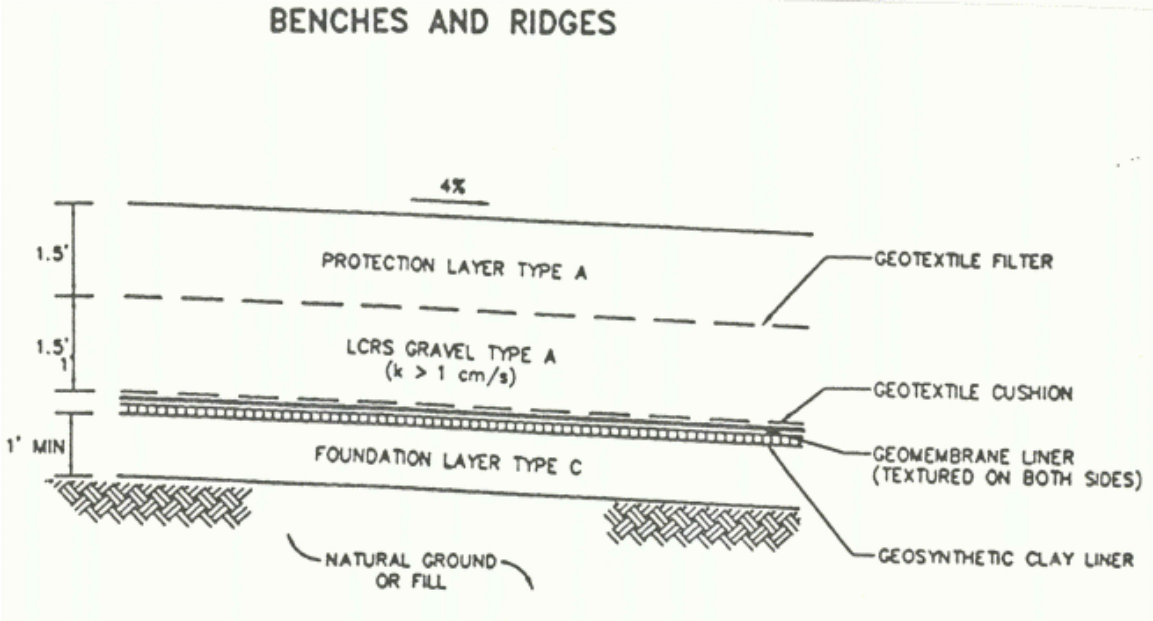
   a. A 16-oz./yd^2 nonwoven needlepunch geotextile
   b. An 80-mil textured (both sides) HDPE geomembrane; and
   d. A geosynthetic clay liner (GCL) with hydraulic conductivity of K≤ 1 x 10^{-9} cm/s.



b. Side slopes – areas of the Landfill with foundation grade greater than 3H:1V, including benches.

1. The composite liner shall consist of

   a. A 16-oz./yd^2 nonwoven needlepunch geotextile
   b. b. An reinforced GCL (K≤ 1 x 10^{-9} cm/s); and
   c. An 80-mil HDPE, smooth on top and textured on the bottom.



c. Benches and Ridges - areas of the Landfill on the side slope with slopes of 3H:1V, or less.

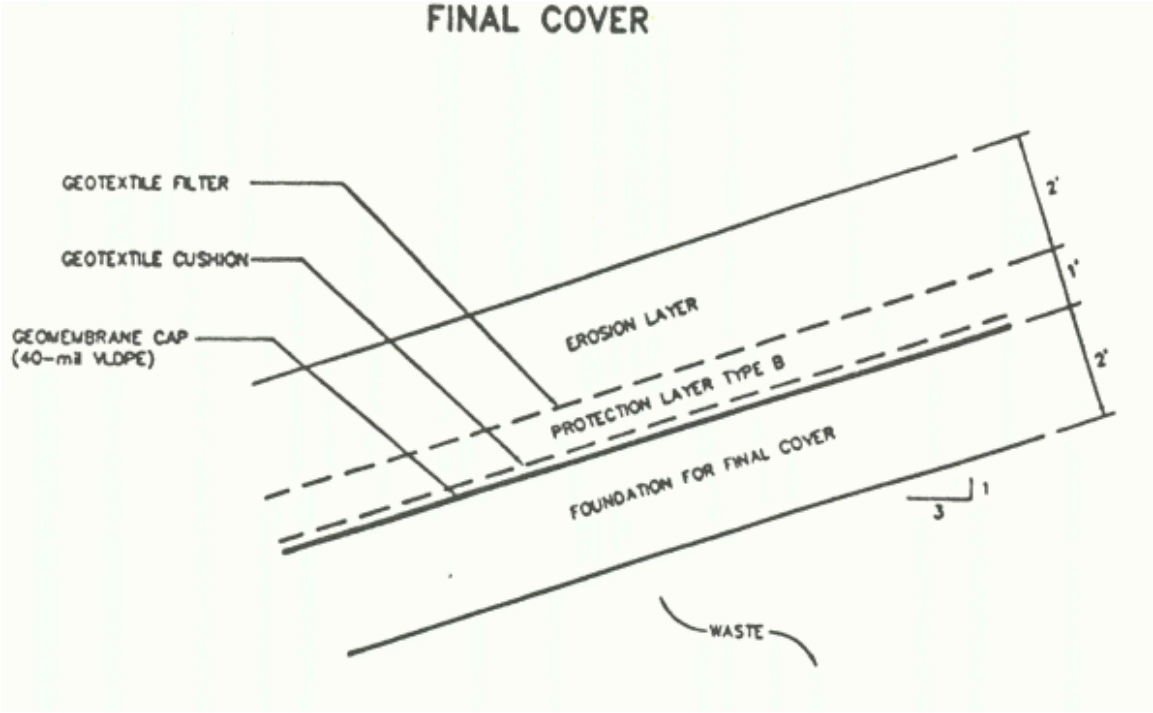
1. The composite liner shall consist of

   a. A 16-oz./yd^2 nonwoven needlepunch geotextile
   b. A reinforced GCL ($K \leq 1 \times 10^{-9}$ cm/s); and
   c. An 80-mil HDE (textured on both sides).

d. Interim cover shall consist of:

1. Daily cover composed of a minimum of 6 inches of compacted soil, or alternative material placed over the waste during or at the end of each working day; and

2. Intermediate cover composed of a minimum of 12-inch of compacted soil, or equivalent, placed over waste areas which shall be inactive for periods greater than 180 days; existing daily cover may be used as part of the intermediate cover.



e. The final cover for the Eagle Mountain Landfill shall be constructed as follows (in ascending order):

1. Foundation for final cover layer – a 24-inch thick layer low-permeability ($K \leq 1 \times 10^{-6}$ cm/s) soil layer to mitigate the effect of differential waste settlement and subsidence on the overlying low permeability layer, and provide a firm smooth subgrade for placement of lower permeability barrier layer (VLDPE).

2. VLDPE – A 40-mil very low-density polyethylene (VLDPE) ($K \leq 1 \times 10^{-10}$ cm/s) geomembrane.

3. Geotextile – A 12-oz/yd^2 nonwoven needlepunch geotextile cushion.

4. Protection layer – A protection layer type B with $K = 1 \times 10^{-2}$ cm/s to protect the VLDPE from damage due to equipment traffic and the overlying erosion layer.

5. Geotextile – an 8-oz/yd^2 nonwoven or woven geotextile.

6. Erosion layer – a 24-inch thick coarse granular material shall be placed on top of the protection layer to control erosion that may be caused by storm water runoff, and to visually blend with the surrounding environment.

7. Slope of the final cover shall be no steeper than 3H:1V on the side and on the top of the Landfill, the slope shall be a minimum of 3 percent.